

REMARKS

Based on the above, claims 1, 63-65, and 73-90 are pending. Claims 1, 63, and 90 are the pending claims. Claims 69-72 have been canceled and claims 73-90 are new.

Claim 1 stands rejected for obviousness-type double patenting over commonly owned U.S. Patent No. 6,625,364. We enclose herewith a Terminal Disclaimer to obviate the rejection.

Claims 1 and 63-65 stands rejected as either anticipated by, or obvious over, Kawanishi (JP 2000-35521 A).

As currently amended, however, claims 1 and 63 recite the confinement region comprising "alternating layers of at least two different dielectric materials surrounding the core about the waveguide axis." We can find no such feature in Kawanishi. To the contrary, Kawanishi describes a cladding that in cross-section includes a two-dimensional grating pattern (see Abstract and Figures of Kawanishi). Thus, we ask the Examiner to withdraw the Kawanishi rejection from claims 1 and 63-65.

The action also rejects claims 1 and 63-65 as obvious over Fink (U.S. 6,463,200). Each of these claims recites a particular range for the diameter of the core. The action concedes that Fink does not disclose such ranges, but indicates that selecting such ranges would be obvious to one of ordinary skill in the art. We disagree.

It is well established that "obvious to try" is an improper rationale applying an obviousness rejection (MPEP § 2145(X)(B)). In particular, an obviousness rejection is not applicable where "what would have been 'obvious to try' would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful." MPEP § 2145(X)(B) citing In re O'Farrell, 853 F.2d 894, 903 (Fed. Cir. 1988). This is the case here.

The invention is directed to a complex set of design parameters for a waveguide, and the claims set forth specific criteria for the waveguide including core radius, and additional features (e.g., the core refractive index, the alternating layer structure of the confinement region, the refractive index contrast of the alternating layers, etc.). Applicants' specification teaches the

significance of such criteria. For example, with respect to the core radius, the specification states:

“The inventors have determined that the fraction of energy outside the core for a guided mode in a photonic crystal fiber scales inversely with the cube of the core radius. Accordingly, radiation and dissipation losses associated with the dielectric confinement layers can be made very small by increasing the core radius” (Page 4, line 27, through page 5, line 1)

“The inventors have further recognized that although the large core leads to multiple guided modes, the multiple modes have attenuation losses that differ significantly from one another. The differential losses among the multiple modes (i.e., modal filtering) rapidly lead to single-mode operation for modest transmission lengths, and thus modal dispersion is avoided.” (Page 5, lines 11-15)

“Nonetheless, the inventors have also recognized that there is an upper limit on the core size. When the core size is too large (e.g., larger than about forty times the wavelength of the guided radiation), the modes become closely spaced, and thus perturbations more easily cause coupling between different modes.” (Page 5, lines 16-19)

Fink, on the other hand, provides no such indication as to how the core radius parameter is relevant and no direction as to how to optimally select the core radius parameter. In particular, the section of Fink cited by the action states:

“As is generally the case, the electromagnetic radiation will be multi-mode or single mode depending on the size of the region in which it is confined. Thus, within each broadband range the electromagnetic radiation can be multi-mode or single-mode depending on the size of the inner core region. For large core radii, the light will be multi-mode and for very small radii the light will be single mode.” (Col. 7, lines 44-50).

In other words, Fink teaches that the core radius may be anywhere from “very small” to “large” - which is to say that Fink provides no direction for selecting the core radius parameter.

Moreover, Fink fails to appreciate the significance of the core radius parameter because he erroneously concludes that a waveguide having a large core radius is limited to multi-mode operation. In contrast, applicants have discovered that the range of larger core radii specifically claimed, can provide both reduced radiation and dissipation losses, and where desired, effective single-mode operation (see above).

Thus Fink gives no indication of how the core radius is critical or any direction as to how to select such parameters to be those claimed, and therefore, in concert with MPEP § 2145(X)(B) and In re O'Farrell *supra*, we submit that the obviousness rejection must be withdrawn.

Furthermore, in view of the above, we point out that the action's reliance on In re Aller and In re Boesch are misplaced. Application of In re Aller requires that "the general conditions of a claim are disclosed in the prior art" before the claimed invention can be considered obvious as "routine experimentation." MPEP § 2144.05(II)(A) citing In re Aller, 220 F.2d 454, 456 (CCPA 1955). Fink fails to provide such general conditions - as described above, he indicates that the core radius may be anywhere from "very small" to "large" and he says nothing to indicate the range claimed for the transverse extent of the confinement range. Moreover, "[a] particular parameter must first be recognized as a results-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable range of said variable might be characterized as routine experimentation [and therefore obvious]." MPEP § 2144.05(II)(B) citing In re Antonie, 559 F.2d 618 (CCPA 1977). Here, Fink fails to appreciate how core radius parameter is a results-effective variable. Indeed, he fails to appreciate that increasing the core radius can decrease radiation and absorption losses and he erroneously concludes that a waveguide with a large core radius is limited to single mode operation. Therefore, we submit that it cannot be "routine experimentation" to select the claimed core radius parameters based on Fink. Similarly, the action's reliance on In re Boesch is misplaced because it too requires that the parameter being optimized is "a results-effective variable." MPEP § 2144.05(II)(B) citing In re Boesch, 617 F.2d 272 (CCPA 1980). Again, therefore, we submit that the obviousness rejection must be withdrawn.

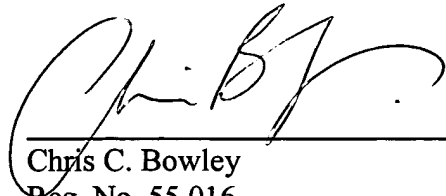
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Enclosed is a \$50.00 check for excess claim fees and a \$225.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 13445-002002.

Respectfully submitted,

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